

Modular Ultra-High Power Solar Array Architecture, Phase II

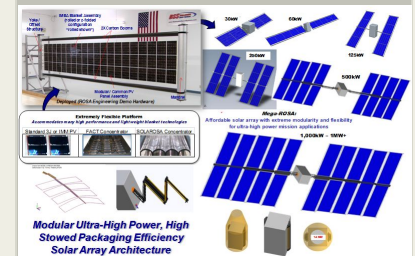
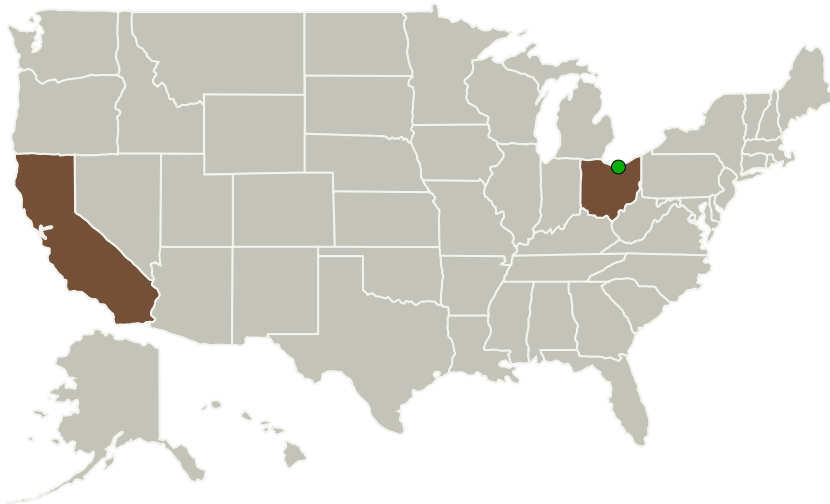
Completed Technology Project (2012 - 2014)



Project Introduction

Deployable Space Systems (DSS) will focus the proposed Phase 2 SBIR program on the hardware-based development and TRL advance of a highly-modularized and extremely-scalable solar array (Mega-ROSA) that provides immense power level range capability from 100kW to many Megawatts in size. Mega-ROSA will enable extremely high power spacecraft applications, including: Solar Electric Propulsion (SEP) spacecraft, SEP space-tug, and large-scale Planetary and Human Exploration missions because of its ground-breaking stowed packaging efficiency, high deployed stiffness / strength, low-cost and straightforward ground test capability. The innovative and synergistic Mega-ROSA solutions, to be validated to a TRL 6 level during the proposed Phase 2 program, will enable future high power missions through low cost (25-50% cost savings depending on PV and blanket technology), high specific power (>200 W/kg to 400 W/kg BOL at the wing level depending on PV and blanket technology), extremely compact stowage volume (>50 kW/m³ for very large arrays), high deployment reliability, platform simplicity (low parts count and reduced potential failure modes), high deployed strength/stiffness (>5X stiffer and stronger than rigid panel arrays of similar sizes), high voltage capability, scalability to ultra-high power (100kW to several Megawatts), and operability in unique environments (high/low illumination, high/low sun intensity and high radiation).

Primary U.S. Work Locations and Key Partners



Modular Ultra-High Power Solar Array Architecture

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Organizations Performing Work	Role	Type	Location
Deployable Space Systems, Inc(DSS)	Lead Organization	Industry	Goleta, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

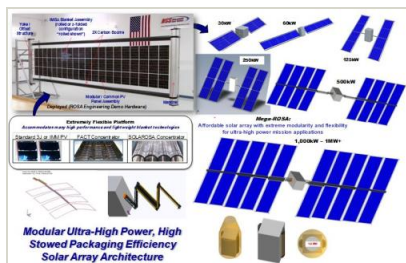
California	Ohio
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Project Transitions

**April 2012:** Project Start**October 2014:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/137378>)

Images

**Project Image**

Modular Ultra-High Power Solar Array Architecture

(<https://techport.nasa.gov/image/129456>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Deployable Space Systems, Inc (DSS)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Brian R Spence

Co-Investigator:

Brian Spence

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Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.1 Photovoltaic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System